



CORAL TRIANGLE INITIATIVE

ON CORAL REEFS, FISHERIES AND FOOD SECURITY



IMPLEMENTATION OF THE ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT IN PAPUA NEW GUINEA



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Implementation of the Ecosystem Approach to Fisheries Management in Papua New Guinea

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EXECUTIVE SUMMARY

Population increases and the transition from a traditional and subsistence economy to the formal cash economy are contributing to the overfishing of coastal fisheries in PNG and other parts of the Pacific. Conventional fisheries-management approaches are failing to stop the trend of overfishing both on a local scale and across the whole range of fisheries.

Ecosystem Approach to Fisheries Management (EAFM) has the potential to reverse the trend of overfishing and contribute towards sustainable fishing practices. Implementation of EAFM is being promoted under the CTI Regional Plan of Action and PNG Marine Program (National Plan of Action), which have EAFM as one of the five goals. PNG does not have a formal policy on EAFM; as a first step, this study report explores and makes suggestions on actions required to assist PNG and the NFA to move closer to full implementation of EAFM principles.

To date PNG does not have specific policies and legislations addressing and implementing EAFM. However, there are draft policies on Fish Aggregation Devices, Community-Based Fisheries Management, and Protected Areas that compliment and support EAFM. Government, NGOs, and other stakeholders do implement elements of EAFM, but they don't have the impact that they could with a clear EAFM policy and an ecosystem approach to fisheries management implemented through management plans focusing on both the target species and the ecosystem that supports that species.

There is no specific legal framework/law addressing implementation of EAFM. However, there is adequate legal coverage to implement EAFM using the various pieces of legislations at both the national and local level. With some specific amendments and modifications to the Fisheries Management Act, 1998—including in Section 28—PNG can fully implement EAFM. This report suggests a specific amendment and modification to Section 28(2) to now read:

“The Managing Director may, and where the Minister so requires shall, cause to be drawn up a Ecosystem and Fishery Management Plan in respect of any fishery resource in the fisheries waters.”

The report also suggests a new sub-subsection under Section 28, subsection 3, to possibly read:

“Identify and describe the status of the ecosystem and its characteristics, including the use of the ecosystem by other users.”

Progress in the right direction towards the full implementation of EAFM is expected in the coming years, with the inclusion of EAFM goals in the PNG Marine Program (PNG National Plan of Action) and the focus of some NGOs on specific EAFM activities. The PNG Marine Program specifies the EAFM goal, targets, and activities that must implemented, and therefore provides an implementation framework for government, NGOs, the private sector, and other stakeholders. Some NGOs, such as The Nature Conservancy, have included very specific EAFM objectives consistent with the PNG Marine Program EAFM goal.

Progress in implementation of the EAFM goal has been slow, but there has been progress made with this review. For example, The Nature Conservancy led training of EAFM (and CEAFM) principles in Manus and Kimbe, where about 200 community practitioners and fisheries officers have been trained. The formation of the EAFM sub-working group—which reports to the PNG Marine Program Technical working group, which in turn reports to the National Co-ordinating Committee (NCC)—is a positive sign.

The key EAFM gaps identified in this study include:

- The need for an EAFM policy that is formally endorsed by the National Fisheries Authority Board.
- No specific EAFM provisions in the current legislations at the National and Local-Level Government. This needs to be addressed by inserting EAFM-specific provisions in the Fisheries Management Act, and formal incorporation of EAFM provisions in the Local-Level Government Environment and Conservation Laws/ Fisheries Laws.
- Fisheries Management Plans implement conventional management approaches. This can be improved by modifying the management plan provisions to allow for the management of fisheries and ecosystem. The management plans would be known as Fisheries and Ecosystem Management Plans.
- Fisheries officers, NGO technical officers, and community field practitioners lack knowledge and experience in EAFM to conduct awareness and be effective in the implementation of EAFM. This can/will be addressed through training on EAFM.

To address the gaps identified above and build capacity for the implementation of EAFM the report suggests development of an EAFM module to be developed and delivered through the National Fisheries College and University of Natural Resources.

I.0 INTRODUCTION

Ecosystem Approach to Fisheries Management (EAFM) is seen as one of the solutions to the ever-pressing problem of overfishing and the degradation of the marine environment (and associated coastlines and watersheds) caused by the exploitation of various fisheries and other sectors of the economy. As Papua New Guinea (PNG) increasingly moves to a more formal cash economy, overfishing of some fisheries is becoming noticeable (e.g. the current moratorium on the harvesting of sea cucumbers). A recent study sponsored by the Secretariat of the Pacific Community and the Forum Fisheries Agency reviewed fisheries across PICTs (Pacific Island Countries and Territories) and found that some coastal fisheries were overexploited and therefore significantly threatening food security and further economic growth in small PICTs (Gillett and Cartwright, 2010).

All major fisheries in PNG are managed by the National Fisheries Authority (NFA) using conventional fisheries-management methods. EAFM can assist in further improving fisheries management as it takes a greater holistic approach to fisheries management and includes a greater array of key stakeholders who may have an interest or impact on a certain fishery. Subsequently, EAFM is an improved management framework by combining conventional fisheries management that manages fishing inputs and efforts as well as focusing on maintaining the structure, diversity, and functioning of both the ecosystem and socioeconomic systems as a whole.

EAFM suits coastal fisheries in PNG for a number of reasons that include:

- Coastal fisheries in PNG are normally multi-species;
- Subsistence and artisanal fishers—individually or through various groups—are involved in fishing activities that impact on a large range of marine ecosystems ranging from the seagrass beds, reef flat, mangroves and lagoon floor, with species often interdependent or inter-related;
- Some communities in PNG have continuing management regimes;
- Some communities have ownership and user rights to the marine environment .

Currently, no single PICT (Pacific Island Country and Territory) has fully adopted EAFM into its national legislations for fisheries management. Through the influence and implementation of the Coral Triangle Initiative (CTI), PNG and the Solomon Islands have the opportunity to formulate national policies and legislation to implement EAFM.

This report explores and makes suggestions on actions required to assist PNG and the NFA to move closer towards full implementation of EAFM principals in its various fisheries.

2.0 METHODS

Information was gathered for this study by reviewing relevant legislations, policies, and various reports (both published and unpublished). One-on-one informal interviews were also conducted with various government officials at the NFA and the Department of Environment and Conservation (DEC), as well as those in the provinces and local-level governments, various staff at non-government organisations (NGOs), community-based organisations (CBOs), government officials, and industry. Interviews and site visits were conducted in Milne Bay, Madang, New Ireland, East New Britain, West New Britain, Bougainville, and Manus provinces.

3.0 EXISTING PROGRAMS ON ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT

3.1 PNG MARINE PROGRAM (NATIONAL PLAN OF ACTION)

The PNG Marine Program is what is known in other CTI countries as the National Plan of Action (NPOA). It is essentially the implementation framework of the CTI's Regional Plan of Action (RPOA) for each of the six participating countries: Indonesia, Philippines, Malaysia, Timore Leste, Solomon Islands, and Papua New Guinea. The PNG Marine Program was launched by the Minister for Environment and Conservation in September 2010. To maintain consistency, the five goals in the RPOA are maintained in the PNG Marine Program. Goal 2 of the PNG Marine Program focuses on EAFM and states: "*Ecosystem approach to management of fisheries (EAFM) and other marine resources fully applied.*" Similar to the RPOA, there are four targets identified under this goal:

1. Strong legislative, policy, and regulatory frameworks in place for achieving an EAFM, with six activities listed to achieve this target (see Appendix I);
2. Improved income, livelihoods, and food security of an increasingly significant number of coastal communities across the region through a new sustainable coastal fisheries and poverty reduction Initiative (COASTFISH), with eight activities listed for this target (see Appendix I);
3. Effective measures in place to help ensure exploitation of shared tuna stocks is sustainable, with tuna spawning areas and juvenile growth stages adequately protected, and seven activities listed for this target;
4. A more effective management and more sustainable trade in live reef fish and reef-based ornamentals achieved, with six activities listed to achieve this target.

The activities and progress on the implementation of the EAFM activities are outlined in Appendix I. All the activities are led by the NFA in partnership with the DEC and conservation NGOs. Implementation of activities under targets 3 and 4 are implemented in collaboration with the industry. The tuna and live food-fish trade are managed with fishery management plans endorsed by the board.

Implementation in PNG has been slow, partly because there is no clearly coordinated approach at the moment on implementation, even though there is a National Coordinating Committee (NCC) tasked with co-ordinating the implementation of the Marine Program. There is expectation that there will be improvement in implementation of the activities when the EAFM Sub-working Group is fully functional (see below). The EAFM Sub-working Group was endorsed late last year by the PNG Marine Program Technical Working Group, which reports directly to NCC.

The PNG Marine Program—with its five goals, targets, and activities—provides the best opportunity for the NFA, the DEC, the Office of Climate Change, and NGO implementing partners to work together under one plan. The fishing industry and other stakeholders are not actively engaged at the national-level meetings through the NCC, but are engaged on a project-by-project basis at the implementation of the Marine Program in the field. The industry is a critical stakeholder and needs to be involved at all levels of EAFM planning and

decision making. It is therefore recommended that DEC and NFA, through the NCC, invite the industry to be part of the NCC and the EAFM sub-working group.

3.2 THE NATURE CONSERVANCY MARINE PROGRAM

The Nature Conservancy (TNC) PNG Marine Program has the following EAFM objectives in support of the PNG Marine Program goal on EAFM: "By 2013, EAFM principles are applied in the management of marine resources in Kimbe Bay." Four Activities is in TNC work plan to support this objective on:

1. Community Ecosystem Approach to Fisheries Management (CEAFM) principles training;
2. Application of CEAFM principles to local management plans;
3. Kimbe Bay wide EAFM plan; and
4. Facilitate and support the NFA and the West New Britain Provincial Fisheries Division to incorporate fisheries-development benefits to communities practicing Locally Managed Marine Areas (LMMAs) and the overall management for Kimbe Bay.

TNC reviewed its marine program in 2009 in relation to how it was implementing EAFM within its community engagement process with field visits to sites in Kimbe, Manus, and Kavieng (Foale, 2009). The study concluded that TNC was generally successful in implementing elements of EAFM with its community engagement process to establish LMMA. However, the study made suggestions for improvement as follows:

- *The need for systematic monitoring of sedimentation in Kimbe Bay, which would improve the understanding of the importance of sediments as a stressor relative to other impacts including coral bleaching and Crown of Thorns Starfish, providing greater leverage in negotiations with groups responsible for the generation of sediment loads;*
- *Improving social and economic baseline work and ongoing monitoring, particularly in the area of reporting, and communicating findings within and outside of the organisation;*
- *Closer attention needs to be paid to marine tenure claims, given their flexibility and the penchant many rural Melanesians have for reinterpretation of their rights in different contexts, in order to assist TNC to design more watertight management plans and agreements;*
- *Increase the amount of Catch Per Unit Effort (CPUE) data, including baseline data generated at the commencement of programs, to allow TNC to more effectively demonstrate the direct economic benefits of its fishery management programs and to assist where Fish Aggregating Device (FAD) programs are used to absorb fishing effort displaced by reef closures;*
- *Improve outreach programs, particularly in the area of communicating stock-recruitment concepts and the biology and ecology of reproduction and dispersal in marine fish and invertebrates. Training and equipping local people to deliver this sort of material would also help, as would collaborating with schools where possible;*
- *Increased efforts to engage community and church leaders about the inevitable pressures that currently rapid rates of human population growth place on marine resources, particularly in places like Pere Village and Kimbe Bay. However, such an objective is somewhat beyond the scope of TNC, and is ideally something conducted at the national level;*
- *Develop a pre-emptive approach to dealing with mining threats, including a review of mining legislation in both PNG and the Solomon Islands, ideally in collaboration with governments, other interested NGOs, and the mining sector; and*
- *Improve information management and training of local volunteers, where a staff exchange program with Mahonia Na Dari may facilitate the cross-fertilisation of ideas on outreach programs.*

TNC has been active for more than 10 years in the West New Britain Province of PNG, and is trying to initiate several programs with regards to EAFM. These programs include:

- Working with the three Local Level Governments (LLGs) within the Kimbe Bay area (Bialla, Hoskins, Talasea) to amend their Marine Environment Management Laws so that it is explicit and clear about EAFM; and
- Working with the West New Britain Provincial Government and the three LLGs to formulate a Kimbe Bay-wide EAFM Plan.

In late 2010 and early 2011, TNC conducted two EAFM training workshops with communities at Mbunai and Pere in the Manus Province. Participants for the training came from the communities and CBOs in Manus, NGOs from other parts of PNG, and government officers from other provinces. As part of the training workshop, participants reviewed the application of Community-based EAFM (CEAFM) principles for the Pere LMMA Management Plan (see Appendix 4).

3.3. MARINE PROGRAM OF OTHER NGOS (WWF, CI, WCS, LOCAL NGOS)

Other NGOs have objectives and activities that contribute to EAFM. For example, WWF's marine program in PNG—which has field sites in Manus and Madang—is focused on community-based management, climate change, Payment for Ecosystem Services (PES), policy and legislative support at the provincial and LLG level, Inshore FAD Policy, and sustainable financing.

WCS's Marine Program—which is based mainly in the New Ireland Province with some field sites in Manus—also compliments and benefits EAFM through its work on scientific monitoring of LMMAs, LLG Environment Management Laws, and coral reef rehabilitation.

CI's work is also focused on community-based management, policy, LLG Environment Management Laws formulation and implementation, climate change impact assessment, population dynamics of turtles, technical support and capacity building to the local communities, and support for the establishment of the PNG Learning and Training Network (LTN). The LTN promotes programs and activities on learning exchanges between communities, good practice tools and methods, and training and capacity building.

Local NGOs such as PNG Center for Community Locally Managed Areas (PNGCLMA), Mahonia Na Dari, and Alan Awareness also have similar programs to the larger international NGOs, but place more emphasis on awareness, community-based management, training, and capacity building.

Collectively, the work of these NGOs contribute towards EAFM, but they don't have the impact they could—especially through management planning—if it there was a clear EAFM policy in place.

4.0 POLICY

There is no officially endorsed policy for the management of fisheries and other marine resources using EAFM at any level of government in PNG; however, there are various policies that could support and contribute towards EAFM, and these are detailed below.

4.1 COMMUNITY BASED FISHERIES MANAGEMENT POLICY

In 2006, the NFA and the Food and Agricultural Organisation (FAO) conducted a study to develop a policy and implementation strategy on Community Based Fisheries Management (CBFM). The study involved stakeholder workshops and meetings and resulted in a policy discussion paper and draft policy on CBFM. A policy submission was drafted for the NFA Board but is still has not been endorsed.

The draft CBFM Policy states:

“It shall be the policy of the government, as part of its commitment to sustainable development, to take a co-management approach to managing fisheries, in particular to adopt and apply community based fisheries management country wide, specifically to small-scale and subsistence fisheries (the CBFM Policy) to:

- *achieve sustainable livelihood of stakeholders, particularly the rural-based population including women and children, in socioeconomic terms;*
- *attain a balanced level of conservation and management action that ensures sustainable use of natural resources and protection of the environment for the benefit of present and future generations; and*
- *contribute to local, provincial, and national revenue generation for the promotion and continuation of sustainable development of Papua New Guinea.”*

During a revision of the Fisheries Management Act, 1998, CBFM rights were included. To date, the revised Fisheries Management Act has not been tabled and passed in the PNG National Parliament. Under Section 32 of the revised Fisheries Management Act, CBFM areas would include the area inside the three-nautical-mile limit from the shoreline. There are a total of 16 sub-sections under Section 32; the first six sub-sections are reproduced below as follows:

Notwithstanding section 3(2), this section applies to all persons, all vessels, and all fishing and related activities;

- (1) *The Authority shall promote community based fisheries management in areas of the fisheries waters within the jurisdiction of local communities;*
- (2) *Any local community may apply to the Authority for the designation of an area of marine waters within its jurisdiction as a community based fisheries management area;*
- (3) *No community based fisheries management area shall extend beyond three nautical miles from the low-water line;*
- (4) *For the purpose of this section, a “local community” is defined as a ward or part of a ward, or a series of wards within whose jurisdiction the area referred to in subsection (3) lies; and*
- (6) *Where the powers of the Authority under this section have been delegated to the provincial or local-level government under a memorandum of agreement or other arrangement referred to in Section 7, application for the designation of a community based fisheries management area shall be made to the provincial or local-level government concerned.*

The establishment of CBFM areas addresses a key important element of EAFM regarding socioeconomic benefits and stakeholder participation, as it allows for the participation of the lower levels of government and ensures greater and meaningful participation of the communities.

In its efforts to improve the management of the beche-de-mer fishery by decentralising management to the provinces and communities, the NFA is working on a draft 20-page CBFM discussion paper. This paper draws on the original CBFM policy discussion paper, but with the additions of new and updated information and initiatives. The revised CBFM policy discussion paper will form a submission to the NFA board in the second quarter of 2013.

4.2 NATIONAL PROTECTED AREA POLICY

The DEC recently completed a policy document recommending the establishment of a Protected Area System (PAS) for PNG (Anon. 2011). The document focuses mainly on the terrestrial protected areas and lacks any real discussion and direction for how the protected area system will be designed, established, maintained, and sustained in the marine environment. There is some discussion on how the PAS will be sustained through endowment funding and grants, but no offered option on where the funding will come from and how much funding the government will provide. The NGO community and other important stakeholders were not consulted before the discussion paper was compiled and therefore did not have input into its content. As a result, the NGO community is very critical of the policy discussion paper.

The PAS policy discussion paper has many areas for improvement, but the most important for the marine area are the following:

- It does not address and offer any discussion on Protected Areas in the marine environment at all;
- It does not acknowledge or address ownership issues and other issues that are different in the sea compared to terrestrial areas;
- It does not build from the previous work done on Protected Areas by NGOs and government itself; for example, the design and implementation of a Kimbe Bay-wide Marine Protected Area network as the building block for a Marine Protected Area system; and
- It promotes sustainable financing as the answer for the whole PAS but does not discuss why sustainable financing has failed previously in PNG.

Since the policy document focuses mainly on the terrestrial PAS, there is an opportunity for the NGO community and partners to work together with DEC and NFA to put together a Marine Policy discussion paper that would address, among other issues, how MPAs contribute and are used for the benefit of fisheries, and how they need to be integrated into the an EAFM.

4.3 INSHORE FISH AGGREGATION DEVICE POLICY

In its effort to develop an inshore small pelagic fishery and improve coastal fisheries overall, the NFA launched the Inshore Fisheries Aggregation Device (IFAD) project aimed at constructing, deploying, and managing FADs in a number of coastal provinces of PNG. To support the project, NFA—in collaboration with WWF—formulated a draft IFAD policy with the following objectives:

- *Manage FAD-dependent and FAD-associated fisheries in the inshore coastal areas at a sustainable level;*
- *Minimise FAD-associated conflicts when they occur between the different FAD stakeholders;*
- *Promote the development of the inshore small-scale pelagic and tuna fisheries; and*

- *Promote the sustainable management of the reef and reef-associated fisheries by diverting some of the efforts to FAD fishing.*

Apart from using FAD as a fishing gear, NFA is also using FAD as a management tool for the coastal fisheries. The key role of the FADs as a management tool will be to divert fishing efforts in the reef fisheries to the offshore areas around FADs. The IFAD policy calls for FAD management to be part of the overall coastal and reef fisheries management using an ecosystem approach. The current wording in the policy is:

“All Fisheries management plans will be formulated following the framework, principles, and guidance of an Ecosystem Approach to Fisheries Management plan. The plans will be structured into a national and provincial plans. Provinces are also encouraged to further decentralise management to the local-level government and community levels.”

5.0 LEGISLATIONS

The conservation, protection, and use of PNG's natural resources (meaning all its biodiversity and ecosystems) is enshrined in the fourth goal of PNG's constitution, which states "PNG's natural resources and environment to be conserved and used for the collective benefit of us all, and be replenished for the benefit of future generations." Various laws enforced by the various government agencies and departments implement and enforce the fourth goal. Legislation that would implement and enforce the core objectives for EAFM falls under the responsibility of the NFA under the Fisheries Management Act, 1998; Fisheries (Torres Strait Protected Zone) Act (Chapter 411); and the Whaling Act. Other primary legislations that would implement elements of the EAFM fall under the responsibility of the DEC and include the National Parks Act, 1982; the Fauna (Protection and Control) Act, 1966; and the Conservation Areas Act, 1978.

When cross reading the various legislations mentioned above, it appears that there is adequate legal coverage to implement EAFM. However, for EAFM to be effectively implemented it needs an overall single legislative framework. To explore the options for how this will work in PNG, the core legislations under the NFA, the DEC, and the various LLGs—with environment and conservation laws—are reviewed below.

5.1 FISHERIES MANAGEMENT ACT, 1998

The Fisheries Management Act, 1998 is the principal legislation allowing for the management and sustainable development of fisheries in PNG. It is also an act that contributes to the implementation of the National Goals and Directive Principles, specifically to promote the management and sustainable development of fisheries.

While Section 3 (2), a, b, c, and d of the Fisheries Management Act does not apply to the taking of fish for personal consumption, and not for sale or trading or for manufacturing purposes; or for sport or pleasure; or by customary fishing; or by artisanal fishing except when it's specified, they are all mentioned in other sections of the act or through the various species-management plans.

The Fisheries Management Act, 1998 is the most relevant and appropriate legislation providing for the basis and framework to manage fisheries and their associated ecosystems using the EAFM approach. In its current form, the act does not specifically cater to or mention EAFM, but it does contain the key elements required. Section 25, which outlines the Management Objectives and Principles (see below), and Section 28 provide for the formulation of Fishery Management Plans (see below), giving support and empowering the NFA to manage fisheries and the ecosystems that support those fisheries.

Section 25(e) specifically obligates the NFA to protect the ecosystem while section 25(f) obligates the NFA to preserve biodiversity. The protection of the ecosystem is further emphasised under Section 25(d) through the application of the precautionary approach in the management of fisheries and other marine resources.

Section 25, which outlines the Management Objectives and Principles, and Section 28, which outlines the formulation and structure of the Fishery Management Plans, are reproduced below:

Section 25. MANAGEMENT OBJECTIVES AND PRINCIPLES.

In exercising powers under and in relation to this Act, the Minister or the National Fisheries Authority, as the case may be, shall have regard to the following objectives and principles in respect of the fisheries waters:

- (a) *promote the objective of optimum utilisation and long term sustainable development of living resources and the need to utilise living resources to achieve economic growth, human resource development and employment creation and a sound ecological balance;*
- (b) *conserve the living resources for both present and future generations;*
- (c) *ensure management measures are based on the best scientific evidence available, and are designed to maintain or restore stocks at levels capable of producing maximum sustainable yield, as qualified by relevant environmental and economic factors including fishing patterns, the interdependence of stocks and generally recommended international minimum standards;*
- (d) *apply a precautionary approach to the management and development of aquatic living resources;*
- (e) *protect the ecosystem as a whole, including species which are not targeted for exploitation, and the general marine and aquatic environment;*
- (f) *preserve biodiversity;*
- (g) *minimise pollution;*
- (h) *implement any relevant obligations of Papua New Guinea under applicable rules of international law and international agreements.*

Section 28. FISHERY MANAGEMENT PLANS.

- (1) *Notwithstanding Section 3(2), this section applies to all persons, all vessels and all fishing and related activities.*
- (2) *The Managing Director may, and where the Minister so requires shall, cause to be drawn up a Fishery Management Plan in respect of any fishery resource in the fisheries waters.*
- (3) *A Fishery Management Plan shall:*
 - (a) *identify the fishery and its characteristics, including its current state of exploitation;*
 - (b) *specify the objectives to be achieved in the management of the fishery;*
 - (c) *identify any possible adverse environmental effects of the operation of fishing activities in the fishery; and*
 - (d) *identify where appropriate any relevant customary fishing rights or practices.*
- (4) *A Fishery Management Plan shall be kept under review and shall be revised as necessary.*
- (5) *Each Fishery Management Plan, and each review of a Fishery Management Plan, shall be:*
 - (a) *endorsed by the Board;*
 - (b) *submitted to the Minister for approval; and*
 - (c) *notified in the National Gazette.*

Fishery Management Plans essentially provide the framework on how fisheries are managed and are therefore going to be critical in implementing EAFM. To accommodate EAFM, Section 28 needs to be amended to implement Section 25(e), (f), (h) on the management objectives and principles. It is suggested that the term “ecosystem” be inserted on Section 28(2) to now read:

“The Managing Director may, and where the Minister so requires shall, cause to be drawn up a Ecosystem and Fishery Management Plan in respect of any fishery resource in the fisheries waters.”

Further amendments will be needed, including inserting a new sub-subsection under subsection 3 to possibly read:

“identify and describe the status of the ecosystem and its characteristics, including the use of the ecosystem by other users.”

5.2 FISHERIES (TORRES STRAIT PROTECTED ZONE) ACT (CHAPTER 411)

The Fisheries (Torres Strait Protected Zone) Act applies only to the area known as the Torres Strait Protected Zone, which stretches from the Western Province in PNG to Queensland in Australia. This Act enforces fisheries-related provisions of the treaty signed between Australia and PNG in December 1978. The act does not apply to:

- (a) traditional inhabitants engaged in traditional fishing; and
- (b) boats used by traditional inhabitants for traditional fishing.

This act focuses almost entirely on actual fishing activities. It does not have any provisions for fishery management plans. The act does not provide for a suitable framework for EAFM, partly because it is linked to the Torres Strait Treaty between Australia and PNG, which aims to protect the culture and customs of Indigenous people in both PNG and Australia.

5.3. CONSERVATION LAWS

Protection, conservation, and trade of biodiversity falls under the responsibility of the DEC, mainly through the following legislations;

- National Parks Act,
- Conservation Areas Act,
- Flora and Fauna (Protection and Control) Act, and the
- International Trade (Fauna and Flora) Act.

The National Parks Act and the Conservation Areas Act essentially apply to land or terrestrial areas. To date there have been no National Parks or Conservation Areas established for any sea area. There was suggestion to use the Conservation Areas Act to protect the nursery grounds for barramundi, but this area is essentially land with water holes and streams. The Fauna (Protection and Control) Act applies to both land and sea and has been used in establishing Wildlife Management Areas (WMA) (Section 15) on reef areas. This act is also able to establish Protected Areas (Section 13) and Sanctuaries (Section 11), although it is vague on details of how to manage these areas. The act is clear on how to establishment and manage WMAs, as it gives details on establishment of management committees and rules for the WMAs. An advantage of WMAs is that it is clear on devolving powers to the customary owners to manage the WMAs. Most of the WMAs—about 90 percent of protected areas in PNG—are therefore managed by the customary land owners. However, management by the customary land owners has largely been unsuccessful (Chatterton. et. al., 2006).

5.4 LOCAL-LEVEL GOVERNMENT LAWS ON ENVIRONMENT AND CONSERVATION

Under Section 44 (1) (p) of the Organic Law on Provincial Governments and Local-Level Governments, LLGs can make laws to manage their marine resources. A number of local-level governments in Manus, Milne Bay,

Western, New Ireland, and West New Britain Province have made use of Section 44(1) to draft laws or pass laws in their local assemblies to manage the environment and resources under their jurisdiction. In general, most of these local-level government laws promote and support ecosystem-based management. For example, the Hoskins, Biialla, and Talasea LLG in the West New Britain Province have very similar laws with the following objectives:

The objectives of this Act are:

- (a) *to protect the marine environment while allowing for compatible economic development in a way that improves the quality of life of local communities and maintains the ecological processes on which life depends;*
- (b) *to sustain the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations, and safeguard the life-supporting capacity of air, water, sea, land and eco-systems;*
- (c) *to ensure that proper weight is given to both the long-term and short-term social, economic, environmental and equity considerations in deciding all matters relating to environmental management, protection, restoration and enhancement;*
- (d) *to avoid, remedy or mitigate any adverse effects of activities on the environment by regulating in an integrated, cost-effective and systematic manner, activities and substances that cause environmental harm; and*
- (e) *to regulate activities which may have a harmful effect on the environment in an open and transparent manner and ensure that consultation occurs in relation to decisions under this Act with persons and bodies who are likely to be affected by them.*

While these local acts don't specifically call for the use of EAFM *per se*, they do call for the protection and economic development of the marine environment while maintaining its ecological process. Although the acts are not clear in mentioning fishing, the common and most viable economic development in the marine environment that local communities rely upon is fishing. Current LMMA Management Plans also regulate the taking of fish or used closed areas to improve local fish and other marine resources.

6.0 INSTITUTIONAL CO-ORDINATION AND COLLABORATION

The NFA as set up under the Fisheries Management Act, 1998 is the main institution responsible for the management of target species that are exploited commercially as a fishery and the management of fishing activities in PNG. The main mechanism through which the NFA regulates fisheries is its licensing mechanism and the implementation and enforcement of fisheries-management plans. The DEC, on the other hand, is responsible for the protection, conservation, and management of PNG's threatened species and biodiversity. At the moment, DEC does this mainly through the establishment and management of Protected Areas.

Collaboration and co-ordination between these two government agencies has not been consistent and is generally weak. Lack of understanding on the level of overlap in responsibility, and the issue of which law takes precedent if there are inconsistencies and conflict, has often been a cause of tension.

Apart from the two government agencies, there are also lower levels of government that have decentralised responsibilities of fisheries and environment, under section 44 of the Organic Law on Provincial and Local Level Government.

Co-ordination, collaboration, and participation of the lower levels of government (provincial, local level, and ward) with NFA and DEC are going to be important to the successful implementation of EAFM. There is an opportunity to make this work through the existing management institutions and structure discussed further below. Figure 1 shows the newly established structure for the co-ordination, collaboration, and implementation of the PNG Marine Program, which is coordinated by the DEC.

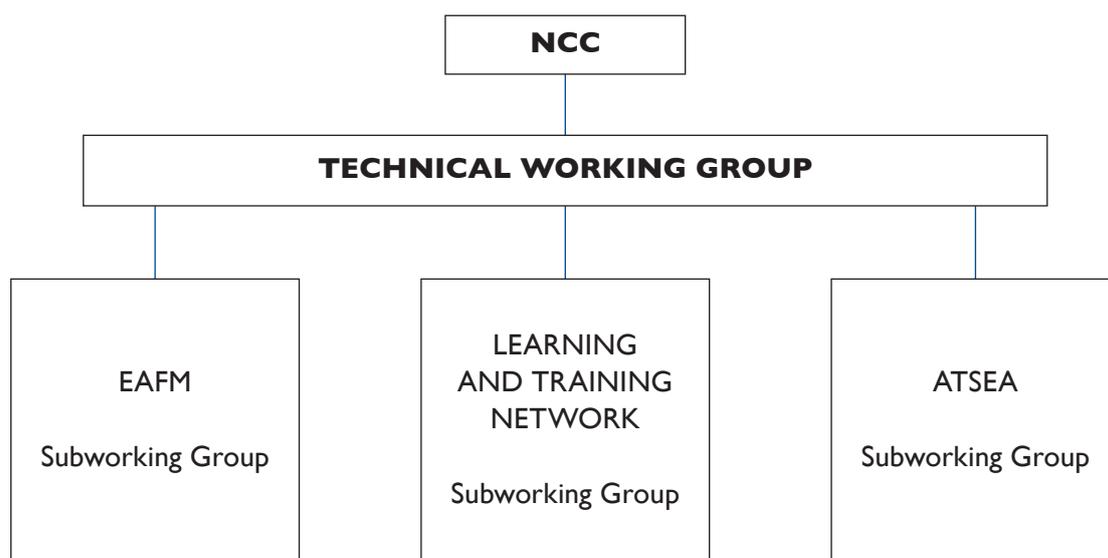


Figure 1. PNG Marine Program Structure with three sub-working groups in place. There may be additional working groups formed, based on needs and interest, from the marine conservation community and the issues that emerge. NCC stands for National Co-ordinating Committee.

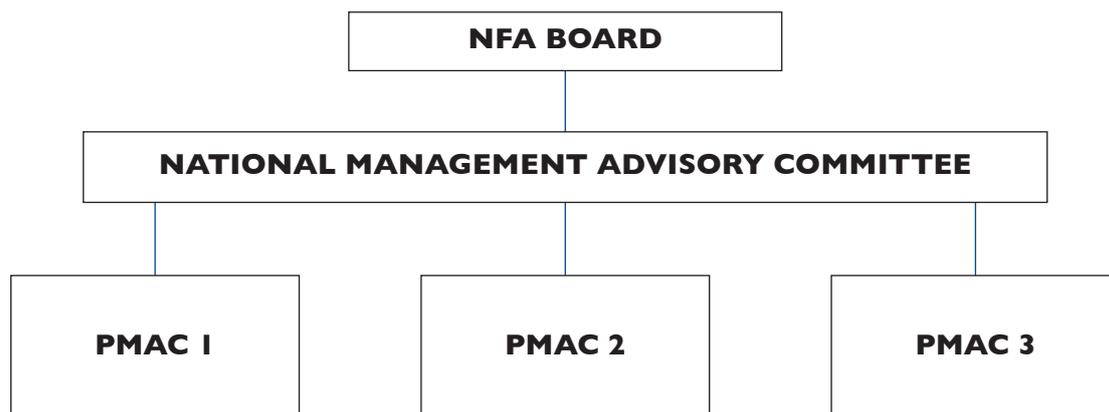


Figure 2. Management structure for the management of the beche-de-mer fishery. PMAC stands for Provincial Management Advisory Committee, which are non functional at the moment. The number represent the number of provinces. The beche-de-mer fishery is currently being reviewed and there are already suggestions to include local-level government management committees.

6.1 EAFM SUB-WORKING GROUP

Progressing and achieving Goal 2 on EAFM will require effective co-ordination and collaboration between the different government agencies and departments, NGOs, the private sector, lower levels of government, and communities. The CTI and PNG Marine Program accommodates this in its structure (see Figure 1 above) through the National Co-ordination Committee (NCC), which has overall responsibility of the implementation of the Marine Program and also acts as the Technical Committee with the role of providing technical advice and overall co-ordination for the implementation of all the five goals of the Marine Program.

The formation and subsequent endorsement of the EAFM sub-working group demonstrates the need and interest in EAFM. Making it work, however, is a challenge, but once fully functional it will help drive positive improvement in ecosystem and fisheries management. A key element of making the EAFM sub-working group work is to find a way to link this sub-working group to the NFA Fisheries Management structure (see Figure 2 above).

The formation of EAFM sub-working group was formally endorsed by the Technical Working Group in its first meeting in December 2011 (see Appendix 2) with the following roles and responsibilities:

- Provide technical advice to the technical working group and NCC on the Implementation of the Ecosystem Approach to Fisheries Management (EAFM);
- Formulate and Review EAFM annual workplan;
- Co-ordinate and guide the development of the EAFM policy;
- Provide technical advice on the implementation of the EAFM policy;
- Co-ordinate the implementation of the EAFM activities as outlined in the Marine Program and revised annual workplans;
- Promote and co-ordinate the ecosystem approach to fisheries management; and
- Co-ordinate training on EAFM.

The EAFM sub-working group, when operational, will have the following core members:

- Two Fisheries Scientists;
- One Social Scientist;
- One Ecosystems Scientist;
- Two Fisheries Planners/Managers;
- One Land-Planning Specialist;
- One Governance Specialist;
- One Policy Specialist; and
- Specific Stakeholders as needed.

6.2 NATIONAL MANAGEMENT ADVISORY COMMITTEE.

A National Management Advisory Committee (NMAC) was originally set up under Section 5 of the National Beche-de-mer Fishery Management Plan.

Section 5 of the National Beche-de-mer Fishery Management Plan specifies the National Management Arrangements through the following subsections:

- (a) The beche-de-mer fishery will be managed nationally. A National Management Advisory Committee (NMAC) will be formed in accordance with clause (g) to provide advice to the Managing Director on the management of the beche-de-mer fishery;*
- (b) The NMAC will provide advice to the Managing Director on management measures as the Managing Director may specify, including total allowable catches, closed seasons, reporting, restrictions, trade, and any other relevant issues that the Managing Director may direct from time to time. The final decision on the fishery management remains with the Managing Director;*
- (c) The NMAC may take on responsibility for advising on management of other marine species if directed to do so by the Managing Director or the Board; and*
- (d) The Managing Director or the Minister may direct the NMAC to examine a particular issue in the fishery or to review all or part of the management plan.*

Since the NMAC is already functional, its role could be expanded to cater to and incorporate EAFM using Section 5(c) of the plan. The Beche-de-mer Management Plan is currently under review, which presents key stakeholders with a real opportunity to work with the NFA to incorporate EAFM into the management of the beche-de-mer fishery. Important changes to the plan would also need to be made so that NMAC expands its membership to include DEC.

7.0 CAPACITY NEEDS ANALYSIS

Capacity is an ongoing need and challenge that has been identified in the past and continues to be an issue that must be addressed for successful marine resource management. In 2001, NGOs and other stakeholders convened a workshop that looked at fostering collaboration to meet conservation capacity needs. The Strengthening Conservation Capacity Project (SCCP) and the production of eight training modules by SCCP are a direct result of that workshop. A similar workshop held in October 2010, aimed at improving community marine conservation and resource management, identified capacity and training needed to be improved for conservation and resource management practitioners.

The formation of the PNG Learning and Training network is a major outcome of that workshop. The capacity and training needs in the development and management of the fishing industry have been addressed by the Training Needs Assessment conducted by National Fisheries College and National Fisheries Authority in 2006 (Blanc and Walton, 2006) and again in 2011 (Kinch et.al. 2011).

Formulation of policy and effective implementation of EAFM will require the identification of EAFM capacity needs and gaps. Fisheries officers interviewed during the Training Needs Assessment of 2011 (which the author of this report was a part of)—and specifically under this study—at the national, provincial, and local-level governments, and NGOs and CBOs, expressed a lack of knowledge and understanding on what is EAFM. Further analysis on capacity needs and gaps is discussed below.

7.1 NATIONAL GOVERNMENT AGENCIES AND DEPARTMENTS

The NFA has good experience in conventional fisheries management through formulation of fisheries-management plans and implementation of the plans. However, there is room for improvement in the implementation of these fishery management plans. Effective implementation of EAFM will require skills for effective co-ordination and collaboration with other government agencies and departments, NGOs, lower levels of government, and communities.

The 2006 and 2011 Training Needs Assessments by the National Fisheries College identified training for NFA Monitoring, Control, and Surveillance division staff to strengthen investigative techniques for enforcement officers. This skill is needed in the effective enforcement and implementation of EAFM.

Institutional enhancement and human resources capacity building was identified as a goal, with a series of strategic actions by the policy discussion paper on community-based management undertaken by the NFA and the FAO in 2006 (Anon. 2006). It calls for the NFA to build the capacity of provinces, local-level government, communities, and CBOs to strengthen their organisations and train them on community-based management. To do that, NFA staff will need to be brought to a level where they can deliver the training effectively.

The marine program of the DEC is small and lacks staff to effectively run it. The focus of DEC's marine program has been on the protection and conservation of threatened species, such as turtles and dugongs. Getting involved in EAFM will require additional human resources to be hired.

7.2 PROVINCIAL AND LOCAL-LEVEL GOVERNMENT

Introducing EAFM in PNG will add to the burden and capacity gap that exists today in the government system. Management capacity to implement the basic fisheries-management plans, and to support community based management and wildlife management areas, is absent, lacking, or very limited at the provincial and LLG levels.

All of the four main layers of government officials who have responsibility for resource management at the provincial, district, LLG, and ward levels lack the knowledge and experience to implement resource-management plans.

Under the Fisheries Management Act, 1998, the NFA has the option to delegate some powers to the provinces and LLGs to implement and enforce rules and management plans. For example, Section 6 of the National Beche-de-mer Fishery Management Plan allows for provinces to set up Provincial Management Advisory Committees (PMACs) to advise and manage province specific management plans. Only the Milne Bay and New Ireland Provinces established these committees, but were not overly productive because of business and political interference.

Protected Areas established under the Flora and Fauna (Protection and Control) Act's Chapter No. 154 are mainly for the protection of protected species as declared under the act, but are normally managed by the communities on land they own. WMAs are the most common form of protected areas used, but with local rules and committees being set up by the communities. Various reviews of the effectiveness of Wildlife Management Areas all indicate implementation has been ineffective.

7.3 NGOS AND CBOS

NGOs and CBOs are very active in the field, implementing marine conservation and community resource management strategies. They are also actively involved in policy formulation and community based fisheries management. They are therefore a critical and important partner in the implementation of EAFM.

NGO (CI, WWF, TNC, WCS) Officers interviewed identified EAFM awareness as an important activity they could be involved in. However, they all lacked knowledge and understanding on EAFM, including the principles of EAFM and CEAFM. There is also a need for technical officers in NGOs to grasp a better understanding of Fisheries Management Plans and the planning process at provincial and LLG levels.

7.4 STRENGTHENING CONSERVATION CAPACITY PROJECT (SCCP)

The SCCP came about as a result of a workshop to develop a framework for a learning program for effective conservation held in 2001. Housed at the University of PNG (UPNG), the project developed eight modules on:

1. Conservation Biology;
2. Biodiversity Conservation Policy and Law;
3. Protected Area Establishment and Management;
4. Organisational Establishment and Management;
5. Fund Raising and Proposal Writing;
6. Economics of Biodiversity Conservation and Ecosystems Services;
7. Public Education; and
8. Community Engagement and Participation.

The modules are focused mainly on land-based conservation and resource management, but they can be easily modified and customised for a marine focus. Module 6 is the closest, with some elements of fisheries in the course, but falls short of addressing capacity needs that will contribute to effective implementation of EAFM.

The overall objective and plan of the SCCP is to absorb the modules into a full Post-graduate Diploma program. Some of the modules are already used in the undergraduate program in the Environmental Science program at the UPNG.

Rather than modifying the existing modules, it is recommended that a new module be written focused entirely on EAFM. This module can then be delivered through the SCCP and the University of PNG's formal programs.

The SCCP was not active in 2011 and 2012 because it did not have sufficient funding to continue the program; however, this has been resolved with new funding support of 1.6 million kina from Exxon Mobil. The funding is being channelled and managed by Mama Graun Trust Fund. The four years of funding support will help UPNG and SCCP hire technical staff, complete writing of three outstanding modules, deliver training, graduate 200 certificates for conservation practitioners, and support 15 scholarships for nine Honours and six Masters graduates in Conservation Biology. This is an opportunity for a partnership with NGOs and the University of PNG to support SCCP to:

- Support customising of the modules for marine conservation and resource management;
- Support the development of a new module on EAFM; and
- Support training to NGO, provincial fisheries officers, and community practitioners on EAFM.

7.5 BUILDING CAPACITY THROUGH TRAINING

To address the capacity gap identified throughout the report it is proposed that a training module on Ecosystem and Fisheries Management (Table 1) is developed. To start the training it is suggested that the module is initially designed as a two-week intensive course. Over a period of two to three years the module would be expanded into a full certificate course, with each of the six units upgraded into full courses.

Development of the Ecosystem and Fisheries Management Module would compliment existing courses at the two main institutions that teach fisheries, marine ecosystem, and related courses that contribute to the understanding and knowledge on EAFM. These institutions include the University of PNG, and the University of Natural Resources (UNRE). The National Fisheries College hosts the second and third year students of the UNRE. Previously, the National Fisheries College focused on the delivery of a Diploma in Tropical Fisheries, but has moved more into building capacity for the development of fisheries industry. Most of the fisheries officers in the provinces and in the private sector have obtained training from the National Fisheries College.

Once the module is put into place it could be delivered through the SCCP at the University of PNG for the Southern Region, and at the National Fisheries College (in conjunction with the UNRE) for the Momase and New Guinea Islands regions.

TABLE I. Proposed course units and topics for the Ecosystem and Fisheries Management Module. Some course unit topics have been modified from the Training Needs Assessment conducted by National Fisheries College in 2011.

COURSE UNITS	TOPICS	TARGET GROUP
Introduction to EAFM	<ul style="list-style-type: none"> – What is a fishery – What is an ecosystem – Fishery relationship and dependence on the ecosystem – Socioeconomics of fishing communities – EAFM principles – Introduction to Ecosystem and Fishery Management 	<p>Government Officers (NFA, DEC, Climate Change Offices), NGO and CBO technical staff</p> <p>Ward Councillors</p>
Fisheries Management	<ul style="list-style-type: none"> – Defining and understanding a fishery – Stakeholders of a fishery – Biology of a fishery – Managing a fishery – Formulating fishery objectives – Precautionary approach – Management principles – Approval process for fishery management plans – Enforcement of management plans – Monitoring a fishery – Reviewing a fishery management plan 	<p>Provincial Fisheries Officers</p> <p>Local Level Government Officers</p> <p>NGO and CBO technical Officers</p>
Community based Fisheries Management	<ul style="list-style-type: none"> – Fisheries Extension Services (the shift from development to sustainable management) – Raising community awareness (planning and implementing awareness campaigns) – Community engagement tools (PRA/PLA/LMMA/Problem Solution Tree) – Community engagement process – Community conservation and management measures – Community versus national management – Community fisheries management plans – Community compliance and enforcement – Supporting community based resources management programs – Components of a successful CBFMP – Alternatives/supporting CBFM 	<p>Provincial Fisheries Officers</p> <p>Local Level Government Officers</p> <p>NGO and CBO technical Officers</p> <p>Ward Councillors</p> <p>Community members</p>

COURSE UNITS	TOPICS	TARGET GROUP
Ecosystem Approach to Fisheries Management	<ul style="list-style-type: none"> – Basic introductions to coastal ecosystems – Estuaries (brackish water systems) – Mangroves (coastal forests) – Beaches and sea grass – Coral reefs and lagoons – Outer reef slopes and open sea – Basic understanding of relationships/interconnections between organisms and ecosystems – Foodwebs – Energy pyramids and trophic levels – Ciguatera and red tides – Coastal ecosystem issues of concern – Direct/Indirect impacts from fishing – Vital role of marine ecosystems – Basic principles of EAFM – Combining the EAFM with CBFM – Community based Ecosystem Approach to Fisheries Management (CEAFM) – Implementing the CEAFM program – Formulating an ecosystem approach to fisheries management plan – Policy and legal support for implementing CEAFM 	<p>NFA and DEC Managers and technical staff,</p> <p>Provincial Fisheries Officers</p> <p>Local Level Government Officers</p> <p>NGO and CBO technical Officers</p> <p>Ward Councillors</p> <p>Community members</p>
Policy and Legislations	<ul style="list-style-type: none"> – Researching policy issues – Drafting policy discussion papers – Drafting policy submissions – Developing fisheries policies – National legislations (NFA, DEC) – Provincial and local-level government legislations – Customary law – Courts and their role – Effective communication to policy makers 	<p>National and Provincial Fisheries Officers, LLG Presidents, NGO Managers, Field Practitioners</p>

COURSE UNITS	TOPICS	TARGET GROUP
Government Planning and Government Processes	<ul style="list-style-type: none"> – Ward development planning – District planning – Provincial planning – Budget processes – Provincial and LLG structures – Provincial and LLG administration 	NGO Managers and technical staff, LLG Presidents, Ward Councillors

8.0 OPPORTUNITIES AND WAYS FORWARD

Introducing and implementing EAFM at this time presents opportunities in policy, legislation, training, and administration because there are initiatives and programs happening that compliment and contribute to EAFM. Two policy initiatives on inshore FADs by the NFA and the PAS by the DEC are in the consultation process, while the policy initiative on CBFM by the NFA needs to go through the formal process of endorsement and approval by the NFA board. These policy initiatives provide an opportunity for CTI, PNG Marine Program, private sector, and NGO implementing partners to work with the NFA and the DEC to make the policies EAFM friendly. For example, the PAS policy should clearly state that the establishment of a MPA should ensure that it contributes to improving and managing fisheries. This should lead the way for an easy road towards formulating the EAFM policy, which should be led and co-ordinated through the EAFM sub-working group. External donors, NGOs and the private sector should be prepared to provide match funding or in-kind support for the formulation of the EAFM policy. It is also important that the NFA provides the bulk of the funding for the EAFM policy formulation to encourage ownership of the policy.

At the national level, NGO partners are encouraged to work through the EAFM sub-working group, which is co-ordinated and hosted by NFA, to provide advice on additional amendments to the current Fisheries Management Act to accommodate and enforce EAFM. At the local level, work directly with LLGs to draft or amend existing environment and conservation laws to accommodate and enforce EAFM.

The recent Training Needs Assessment by the National Fisheries College and the SCCP at the UPNG address capacity issues for the fishing industry and conservation community respectively, but they also contribute directly to the capacity building needs of EAFM. The CTI, PNG Marine Program, and NGO implementing partners are encouraged to work with the NFC, UPNG, and UNRE to develop the six units for the EAFM module. Once the units are completed, they can be delivered separately as short courses. For example, the unit on Introduction to EAFM, which contains EAFM principles, is needed at the moment and could be delivered by either the NFC or the SCCP. TNC has under its 2012 work plan the delivery of the principles to EAFM training workshop for its community practitioners at Kimbe Bay. The two previous EAFM principles training workshop in Manus and the Kimbe Bay would also be well placed to inform the full development of the Introduction to EAFM units. It is also strongly suggested that TNC should modify its EAFM principles training for Kimbe into the Introduction to EAFM training.

TABLE 2. List of course units and the contributing partners for the full development of the course units.

COURSE UNITS	Contributing Partners	Comments
Introduction to EAFM	TNC, NFA	TNC conducted two EAFM principles trainings in Manus and will soon conduct one training in West New Britain Province. TNC to modify and absorb its CEAFM principles training and take the lead for the development of this course.
Fisheries Management	NFA, NFC, UNRE, UPNG	

COURSE UNITS	Contributing Partners	Comments
Community based Fisheries Management	NFC, SPC, Ailan Awareness, NGOs	Course delivered at NFC, but need to be customised for specific target group
Ecosystem Approach to Fisheries Management	NFA, DEC, NGOs	NFC to take the lead in the development of this course into a two-week intensive course.
Policy and Legislations	NFA, DEC, Provinces, LLGs, NGOs	
Government Planning and Government Processes	NFA, DEC	

To address the immediate capacity gaps, to understand the principles of EAFM and CEAFM and begin the process of implementing EAFM, course unit 1 and course unit 4 (outlined in table 2 above) should be developed into full courses immediately. A draft of the course description is provided in Appendix 5. TNC has already delivered the EAFM principles training and could take the lead on this unit. The 2011 Training Needs Assessment by the National Fisheries College identified EAFM as a course that would be delivered as part of the coastal fisheries resources management-capacity building. The NFC, in collaboration with the UNRE, should therefore take the lead on the EAFM course (see Appendix 6 for draft course description). The UNRE already, under the advice from the National Fisheries College, has incorporated EAFM into its Diploma and Degree Program on Fisheries and Marine Resource Management.

The key steps for TNC, as the suggested lead for the Introduction to EAFM course (see draft course description and outline in Appendix 5) would be:

1. Review principles to CEAFM training workshop in Manus;
2. With input from the Manus EAFM workshops, compile materials and write course for the Introduction to EAFM;
3. Deliver the Introduction to EAFM course in Kimbe Bay;
4. Review and modify the course;
5. Liaise with NFC/UNRE to adopt the course;
6. Draft course outline for submission to Academic Committee (Draft in Appendix 5);
7. NFC/UNRE submit course to UNRE Academic Committee for endorsement and approval;
8. NFC/UNRE deliver the course in 2013; and
9. PNG Learning and Training Network promote the course.

Development of the EAFM course (see Appendix 6 for draft course description and outline) as unit 4 in the above table is best led by NFC/UNRE. The key steps for the development of this course are:

1. Draft the EAFM course outline (draft in Appendix 6);
2. Submit course outline to UNRE for endorsement and approval;
3. Compile materials and write the full course;
4. NFC and UNRE deliver the EAFM course in 2013; and
5. PNG Learning and Training Network promote the course.

The administration of EAFM falls under the responsibility of NFA but its successful implementation will require the involvement of all stakeholders with interest in fisheries, ecosystems, and the well being of coastal communities. Involvement of the stakeholders through participation in management will need to be significantly improved. Administration and implementation of CTI through the PNG Marine Program structure with the NCC, technical working groups, and the EAFM sub-working groups provides some improvements in NGO stakeholder participation in the management process and therefore provides for a good administrative platform for implementing EAFM. The CTSP and NGO partners' continued involvement in supporting the DEC and the NFA through NCC, technical working groups, and the sub-working groups will be critical to successful implementation of the EAFM goal as specified under the Marine Program.

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Fisheries (Torres Strait Protected Zone) Act (Chapter 411)

Hoskins Rural Local Level Government Marine Environment Management Law, 2004

International Trade (Fauna and Flora) Act. Chapter No. 391.

Talasea Rural Local Level Government Marine Environment Management Law, 2004

Bill

Fisheries Management Bill 2004

APPENDIX I.

EAFM TARGETS, ACTIVITIES AND THEIR IMPLEMENTATION STATUS UNDER GOAL 2 OF THE MARINE PROGRAM

TARGET # 1: Strong legislative, policy and regulatory frameworks in place for achieving an Ecosystem Approach to Fisheries Management (EAFM)

ACTIVITY	Key Performance Indicator (KPI)	STATUS
2.1.1 Conduct a stakeholder and SWOT analysis in relation to EAFM.	<ul style="list-style-type: none"> – Project proposal approved – Analysis commenced – Final results received 	Not Started
2.1.2 Review and strengthen decentralization arrangements in relation to coastal fisheries management.	<ul style="list-style-type: none"> – Project proposal approved – Review commenced – Final report – Commence strengthening initiatives 	Not started
2.1.3 Evaluate and strengthen linkages between national, provincial and local level government laws, in line with MTDS, LTDS, and MDGs.	<ul style="list-style-type: none"> – Commence evaluation – Evaluation completed – Commence linkage strengthening initiatives 	Not Started
2.1.4 Critically assess the improvement of enforcement capacity at the provincial and local levels.	<ul style="list-style-type: none"> – Methodology and approach approved – Review commenced – Review completed 	Not formally started but NGOs involved with LLG through LLG laws
2.1.5 In view of the above, revise and incorporate EAFM amendments to the Fisheries Management Act 1998.	<ul style="list-style-type: none"> – Proposed amendments drafted – Propose amendments implemented 	Minor amendments proposed in this report.
2.1.6 Explore feasibility of re-investing a portion of tuna revenue to fund small grants and loans for local fishermen to fund activities in relation to EAFM.	<ul style="list-style-type: none"> – Discussion paper prepared – Discussion paper circulated – Analysis and presentation of comments and options 	NFA provides grants for coastal fisheries development

TARGET # 2: Improved income, livelihoods, and food security of an increasingly significant number of coastal communities across the region through a new sustainable coastal fisheries and poverty reduction initiative (“COASTFISH”).

ACTIVITY	Key Performance Indicator (KPI)	STATUS
2.2.1 Implement Coastal Fisheries Management and Development Project (CFMDP) in Milne Bay, Morobe, and New Ireland.	<ul style="list-style-type: none"> – Implementation commenced – Annual review of progress – Project completed 	Project funded under ADB but has not been continued. NFA has not restarted this activity to date.
2.2.2 Implement community-based fisheries management (CBFM) models.	<ul style="list-style-type: none"> – Project and program design completed – Implemented commenced – CBFM models adopted by communities 	Being implemented by NGOs
2.2.3 Mobilise significant new financial investments to support “COASTFISH”	<ul style="list-style-type: none"> – Develop Coastfish Investment Plans – Commence implementation of Plans – Annual review of progress 	
2.2.4 Through National Fisheries Authority, channel funding to National Development Bank targeted towards promoting micro- and small-scale fisheries.	<ul style="list-style-type: none"> – Policy proposal developed – Proposal endorsed – Implementation commenced 	
2.2.5 Upgrade Kavieng Fisheries College.	<ul style="list-style-type: none"> – Approval for upgrade – Upgrade commenced – Upgrade completed 	Ongoing
2.2.6 Build Mariculture Research Station in Kavieng.	<ul style="list-style-type: none"> – Proposal developed and approved – Construction completed 	Ongoing and almost complete
2.2.7 Improve marketing of marine products, including diversifying and expanding markets.	<ul style="list-style-type: none"> – Marketing strategy commenced – Marketing strategy completed – Strategy implementation commenced – Strategy in place 	
2.2.8 Conduct quantitative assessment of by-catch (prawn, tuna, others).	<ul style="list-style-type: none"> – Project design completed – Commence assessment – Annual assessment of progress – Assessment completed 	Ongoing

TARGET # 3: Effective measures in place to help ensure exploitation of shared tuna stocks is sustainable, with tuna spawning areas and juvenile growth stages adequately protected.

ACTIVITY	Key Performance Indicator (KPI)	STATUS
2.3.1 Build a sustainably managed tuna industry and maximize economic benefits.	<ul style="list-style-type: none"> – Tuna Fisheries Management Plan in place – Annual review of plan implementation – Annual assessment of economic performance 	Ongoing
2.3.2 Conduct tuna stock assessments and research on the socio-economics of the tuna fishery.	<ul style="list-style-type: none"> – Project design completed – Stock assessments conducted – Annual reporting of assessment results 	Ongoing
2.3.3 Implement Vessel Monitoring System (VMS) for tuna fisheries.	<ul style="list-style-type: none"> – VMS designed – VMS implementation commenced – Annual review of implementation – VMS system in force 	Implemented and on going
2.3.4 Conduct diagnosis and analysis of current situation and opportunities.	<ul style="list-style-type: none"> – Survey designed – Diagnosis and analysis process commenced – Draft report – Final report 	
2.3.5 Create a learning network group to lead the analysis and clearly define partners' roles with greater civil society involvement (church, development agencies, etc.)	<ul style="list-style-type: none"> – Learning network designed – Learning network process commenced – Annual reporting on performance of network 	Started
2.3.6 Build capacity for all local fishermen to understand tuna fishery, including protection of juveniles.	<ul style="list-style-type: none"> – Program designed – Program commenced – Annual reporting of performance – Final report 	
2.3.7 Promote and encourage protection of key spawning tuna fishery areas. (e.g.: Former Mogardo square)	<ul style="list-style-type: none"> – Areas identified – Program for protecting sites developed – Program Implemented – Annual reporting of success – Final report 	

TARGET # 4: A more effective management and more sustainable trade in live reef fish and reef-based ornamentals achieved.

ACTIVITY	Key Performance Indicator (KPI)	STATUS
2.4.1 Develop a national management plan for the ornamental fishery.	<ul style="list-style-type: none"> – Management plan prepared – Plan implementation commenced – Annual review of plan performance – Final evaluation 	Draft plan available with the assistance of SPC
2.4.2 Update the national Live Reef Food Fish (LRFF) management plan.	<ul style="list-style-type: none"> – Review process commenced – Review completed – Management Plan updated 	Not started
2.4.3 Conduct analysis of current situation and opportunities.	<ul style="list-style-type: none"> – Survey designed – Diagnosis and analysis process commenced – Draft report Final report 	
2.4.4 Create a learning network group to lead the analysis and define partners' roles with greater civil society involvement. (church, development agencies, etc.)	<ul style="list-style-type: none"> – Learning network designed – Learning network process commenced – Annual reporting on performance of network 	Started
2.4.5 Educate and train fishermen to understand LRFF trade and ornamental fish.	<ul style="list-style-type: none"> – Education program designed – Education program implemented – Annual review of performance – Final report on evaluation of program 	Not started
2.4.6 Promote and encourage protection of spawning areas for species target by ornamental and LRFF.	<ul style="list-style-type: none"> – Strategy developed – Strategy implemented – Annual review of strategy performance – Final evaluation of strategy performance 	Started

APPENDIX 2.

MARINE PROGRAM TECHNICAL WORKING GROUP MEETING MINUTES SHOWING MINUTES FOR THE SECTION ON EAFM SUB-WORKING GROUP DISCUSSION. MEETING WAS HELD ON THE 12 DECEMBER 2011 AT THE NFA MEETING ROOM.

5B. ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT

Chairman asked Paul to give the background to the EAFM sub-working group. Paul presented a brief paper (attached) as background. After the presentation, chairman invited members for comments and discussion. The following comments and issues were raised:

- A question was raised if turtles are managed under Fisheries. Turtle normally falls as an endangered species and is managed by the various environment legislations but is managed as a by-catch under fisheries. This is mainly done through the turtle exclusive device in the prawn fishery.
- It was emphasised that technical people involved in implementation of the EAFM goal or have expertise in Fisheries and Ecosystem should be part of the working group. What do we do so that we avoid having the same people in all the groups?
- People who are doing the doing will be in Technical working group. Expertise that counts and not the Organizations.
- Include economist in the Membership of the sub-working group.
- In the roles of the sub-working group, delete NCC in the text and only include the Technical Working group.
- Add text in the roles as follows; monitor and report progress and formulate and review the annual work plan.

Motion:

- Maxine moved the motion to endorse the formation of the EAFM sub-working group and that NFA will be chairman and the Secretariat to the sub-working group. Barbara seconded the motion. Motion supported by consensus.

APPENDIX 3.

NATIONAL BECHE-DE-MER FISHERY NATIONAL AND PROVINCIAL MANAGEMENT ARRANGEMENTS AS SPECIFIED UNDER SECTIONS 5 AND 6.

5. National Management Arrangements

- (a) The beche-de-mer fishery will be managed nationally. A National Management Advisory Committee (NMAC) will be formed in accordance with clause (g) to provide advice to the Managing Director on the management of the beche-de-mer fishery.
- (b) The NMAC will provide advice to the Managing Director on management measures as the Managing Director may specify, including total allowable catches, closed seasons, reporting, restrictions, trade, and any other relevant issues that the Managing Director may direct from time to time. The final decision on the fishery management remains with the Managing Director.
- (c) The NMAC may take on responsibility for advising on management of other marine species if directed to do so by the Managing Director or the Board.
- (d) The Managing Director or the Minister may direct the NMAC to examine a particular issue in the fishery or to review all or part of the management plan.
- (e) The plan will be reviewed by the NMAC at the direction of the Managing Director at least every three (3) years or at such earlier time as the Managing Director shall direct.
- (f) Subject to prior approval of the board, any review of the management plan shall be made public by the NMAC and comments will be invited from all stakeholders in the fishery.
- (g) The National Management Advisory Committee will consist of the following persons, appointed by the Managing Director:
 - i. two National Fisheries Authority (NFA) representatives (one will be appointed Chair)
 - ii. one fishery scientist
 - iii. two customary fisher representatives
 - iv. two fishing industry representatives nominated by the fishing industry
 - v. a representative from a non-government organization whose objectives include conservation of the marine environment and resources and;
 - vi. one representative each from the Region Fisheries Secretariats for Southern, Momase and New Guinea Islands.
- (h) No more than two members may represent groups or government from the same province.

- (i) Elected political office holders are ineligible for membership of the NMAC. Should an NMAC member be elected to political office during their term he or she must resign their membership. Persons who nominate for provincial or national election shall stand down.
- (j) The two representatives from NFA will serve as permanent members. Other members to the NMAC will serve for three-year terms. Representatives from Regional Secretariats will serve for one year and on rotational basis between provinces.
- (k) The NMAC and its members will operate in accordance with the following procedures and such other procedures and standards as may be set by the board:
 - i. A quorum requires two thirds of all members and must include one NFA representative;
 - ii. The managing director shall, with the endorsement of the board, lay down operational procedures for the NMAC, including place and dates for meeting and the NMAC shall meet at least once a year;
 - iii. Prior to taking up membership, representatives will be required to disclose any direct or indirect personal or pecuniary interests in the fishery, otherwise than as a member of, and in common with the other members of, an incorporated company consisting of not less than 25 persons. The nature of his or her interest shall be disclosed as soon as possible to the NMAC. Such a disclosure shall be recorded in the minutes of the NMAC and submitted to the Managing Director;
 - iv. The NMAC and managing director must be advised of any substantive changes in such interests, or new such interests, during the course of membership. The Managing Director will determine if a change in interests will affect that member's term; and
 - v. Where a member who has an interest described in subsection 5(k)(c) has not made a disclosure in accordance with that subsection, his or her vote shall be null and void retrospectively from the time such interest is considered and determined by the managing director, and the managing director shall terminate the appointment of such a member.

6. Provincial Management Arrangements

- (a) To ensure strong input from the provinces, NFA will encourage provinces in the formation of Provincial Management Advisory Committees (PMACs).
- (b) PMACs will advise the NMAC on province-specific management arrangements.
- (c) NFA will only recognise PMACs that comprise broad representation of marine resource users in the province, and the membership of each PMAC must include:
 - i. One representative from Provincial Administration;
 - ii. One District Administrator;
 - iii. Three customary fisher representatives (from different local-level government areas);
 - iv. Two local fishing industry representatives;
 - v. One NFA representative;
 - vi. One provincial fisheries officer; and
 - vii. One representative from a non-government organisation whose objectives include conservation of the marine environment and resources.
- (d) The PMAC may submit a request to the NMAC, with justification, for members representing other stakeholder groups in the province.

- (e) The PMAC and its members will operate in accordance with the following procedures and such other procedures and standards as may be set by the board:
 - i. The chair of the PMAC will be voted in by a two-thirds majority;
 - ii. A quorum requires any six members and must include one customary fisher representative, the chair, and an NFA representative;
 - iii. The PMAC will meet as required, but no less than twice a year.
- (f) The managing director will determine, on the recommendation of the NMAC, if a PMAC will be represented on the NMAC. The composition of the PMAC will be the deciding factor. A PMAC must not include any elected political office holders from the national or provincial government or person nominated for such office.
- (g) PMAC may be consulted on other fisheries.
- (h) The PMAC may, in consultation with the provincial government, develop a schedule to the National Beche-de-mer Management Plan that covers province-specific management measures. The NMAC will endorse PMAC schedules for board approval if they are consistent with the provisions of the management plan.

APPENDIX 4.

APPLICATION OF CEAFM PRINCIPLES TO THE LMMA PLANS AT PERE VILLAGE IN MANUS. REPRODUCED FROM LOKANI AND KAS (UNPUBLISHED)

CEAFM Principle	APPLICATION by PERE COMMUNITY	NOTES/ACTION REQUIRED
Keep the process simple	No/ No set principles	Took Longer time. Use LMMA. Review current process. Broader community participation.
Respect Local customs and protocols	Yes	Document of local customs and process
Maximise Community Participation	Yes applied in Management Plan	More /other alternative income generation activities
Make use of Traditional Knowledge	Yes	Further documentation of traditional knowledge.
Use Science to Support Community Objectives	Yes applied in Management Plan	Document traditional knowledge(TEK), Apply TEK into Management Plan
Enlist the support of broad range of Government Agencies	Yes/N	FAD and LMMA Monitoring
Use Demand Based system	Yes	Policy Support, Threatened Species Survey

APPENDIX 5.

DRAFT COURSE OUTLINE FOR THE INTRODUCTION TO EAFM COURSE

TITLE: INTRODUCTION TO ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT

Background:

Increased populations, and the increasing demand for fish and other marine resources for food and other uses, are putting pressure on the fisheries and marine environment in ways never experienced in PNG in the past. PNG and other parts of the Pacific are experiencing over-harvesting of marine resources at an increasing rate. Many communities complain of localised overfishing. The increasing land-based developments through agriculture, mining, and urbanisation are adding to this problem.

Conventional fisheries management alone is unlikely to reverse the trend of overfishing. The use of an ecosystem approach combined with conventional fisheries management has the potential to reverse the overfishing trend and promote sustainable fisheries.

General Objectives and Learning Outcome:

At the end of this course you should be able to:

- Understand how a typical coastal fishery operates in PNG;
- Understand the basic structures of an ecosystem;
- Understand the interdependency between a fishery and the ecosystem;
- Have a clear knowledge and understanding of the principles of EAFM and CEAFM;
- Understand the basic concept and elements of an Ecosystem and Fishery Management plan; and
- Appreciate and understand why socioeconomics is important in ecosystem-based fisheries management.

Course Description:

The course will start with an introduction to the history and description of typical coastal fishery in PNG, to give you an appreciation and understanding of the many challenges in managing a coastal fishery. Then it will introduce the concept of an ecosystem at different scales and discuss how the fishery target species use the ecosystem, why they depend on it, and why fisheries management needs to also manage the broader ecosystem. After an good understanding of the biological and fishery elements is set, the course will cover the socioeconomic elements of fishing communities and discuss which of the socioeconomic parameters are critical and important in influencing fishermen behaviour. With a basic understanding on fisheries and ecosystem and the human elements of fisheries, the course will introduce the concept of principles—why they matter and are important—before diving deeper into the many principles of ecosystem-based fisheries management and the specific community based ecosystem approach to fisheries management being promoted by Secretariat of the

Pacific Community. The course will then move to introduce the concept and the elements of an ecosystem approach to fisheries management and finish off with an introduction to the basic structure of a good ecosystem and fisheries-management plan.

COURSE REQUIREMENTS:

Course Outline:

TOPIC 1: Introduction to the history and descriptions of typical coastal fisheries in PNG

TOPIC 2: Introduction to the concept of an ecosystem and the different scales of an ecosystem

TOPIC 3: Fishery relationship and dependence on the ecosystem

TOPIC 4: Socioeconomics of fishing communities

TOPIC 5: Principles of EAFM and CEAFM

TOPIC 6: Introduction to Ecosystem Approach to Fisheries Management

TOPIC 7: Introduction to the basic structure of an Ecosystem and Fishery Management plan

Assessment:

Homework/Class Exercise: 40%, Field Report: 20%, Essay: 40%

Prescribed Reading:

FAO 2003. The ecosystem approach to fisheries. FAO Technical Guidelines for Responsible Fisheries, no. 4, suppl. 2. Rome: FAO. 112 p.

FAO 2008. Fisheries management. 2. The ecosystem approach to fisheries. 2.1. Best practices in ecosystem modelling for informing an ecosystem approach to fisheries. FAO Fisheries Technical Guidelines for Responsible Fisheries, no. 4, suppl. 2, add. 1. Rome: FAO. 78 p.

King M. and Lambeth L. 2000. Fisheries management by communities; a manual on promoting the management of subsistence fisheries by Pacific Island communities. Noumea, New Caledonia: Secretariat of the Pacific Community. 87 p.

Preston G. 2009a. The ecosystem approach to coastal fisheries and aquaculture in Pacific Island countries and territories. Part 1: A review of current status. Part 2: Principles and approaches for strategic implementation. TNC Pacific Island Countries Report no. 1/08. Noumea, New Caledonia: Secretariat of the Pacific Community (SPC) and The Nature Conservancy (TNC). 123 p. http://www.spc.int/coastfish/Reports/EAFM_Workshop/Ecosystem_rpt1.pdf. Retrieved from the Internet 13 February 2010.

Preston G. 2009b. The ecosystem approach to coastal fisheries and aquaculture in Pacific Island countries and territories (booklet). Secretariat of the Pacific Community and The Nature Conservancy. Noumea, New Caledonia. 20 p. http://www.spc.int/coastfish/Reports/EAFM_Workshop/EAFM_Booklet.pdf. Retrieved from the Internet 13 February 2010.

SPC, 2010. A community-based approach to fisheries management: guidelines for Pacific Island countries. Secretariat of the Pacific Community.

APPENDIX 6.

COURSE DESCRIPTION FOR THE EAFM COURSE

TITLE: ECOSYSTEM APPROACH TO FISHERIES MANAGEMENT

Background:

Increased populations, and the increasing demand for fish and other marine resources for food and other uses, are putting pressure on the fisheries and marine environment in ways never experienced in PNG in the past. PNG and other parts of the Pacific are experiencing over-harvesting of marine resources at an increasing rate. Many communities complain of localised overfishing. The increasing land-based developments through agriculture, mining, and urbanisation are adding to this problem.

Conventional fisheries management alone is unlikely to reverse the trend of overfishing. The use of an ecosystem approach combined with conventional fisheries management has the potential to reverse the overfishing trend and promote sustainable fisheries.

Objectives:

At the end of this course you should be able to:

- Understand the different habitat types and their importance to fisheries;
- Understand the role of the marine ecosystems;
- Have the basic understanding of relationships/interconnections between organisms and ecosystems;
- Understand the different coastal ecosystem issues that affect the ecosystem and the fisheries;
- Have a clear knowledge and understanding of the principles of EAFM;
- Have the basic skills and understanding on Community-based Ecosystem Approach to Fisheries Management (CEAFM);
- Have the skills and knowledge to formulate an Ecosystem Approach to Fisheries Management plan;
- Understand how to merge conventional fisheries management and ecosystem-based management into a single management regime; and
- Understand policy and legal mechanisms needed to support and implement EAFM and CEAFM.

Course Description:

In this course you will be introduced to the tropical coastal ecosystems and the major habitat types that are the building blocks of coastal ecosystems. The major habitat types to be studied will include estuaries (brackish water systems), mangroves (coastal forests), beaches and sea grass, coral reefs, and lagoons, outer reef slopes and open sea. Right after gaining this knowledge and understanding of coastal ecosystems, you

will be introduced to the complex relationships and interconnections between organisms—including fishery target species—and the ecosystems. After this you will be taught to understand the different issues that affect coastal ecosystems and why they too need to be managed. Then we will move to cover the principles of EAFM before moving on to introduce you to understanding Community Based Ecosystem Approach to Fisheries Management (CEAFM). An important part of the course is to give the skills and knowledge to apply in the real world by giving the information to formulate an Ecosystem Approach to Fisheries Management plan. The formal classroom sessions of the course will end with giving you the knowledge and understanding on why and how policy and legislation are important for successful Ecosystem Approach to Fisheries Management. As part of the course work you will be required to design a field project to be implemented with a community to formulate a Community Based Ecosystem Approach to Fisheries Management Plan.

COURSE REQUIREMENTS:

Course Outline:

The course teaches the three important components of ecosystem-based fisheries management and will include the following topics:

TOPIC 1: Basic introductions to coastal ecosystems

- Estuaries (brackish water systems)
- Mangroves (coastal forests)
- Beaches and sea grass
- Coral reefs and lagoons
- Outer reef slopes and open sea

TOPIC 2: Basic understanding of relationships/interconnections between organisms and ecosystems (food webs, energy pyramids and trophic levels, Ciguatera and red tides)

TOPIC 3: Coastal ecosystem issues of concern (Include direct/indirect impacts from fishing, coastal developments, etc.)

TOPIC 4: Basic principles of EAFM

TOPIC 5: Community Based Ecosystem Approach to Fisheries Management (CEAFM)

TOPIC 6: Formulating an Ecosystem Approach to Fisheries Management plan

TOPIC 7: Policy and legal support for implementing EAFM and CEAFM

Assessment:

Home work/Class Exercise: 40%, Field Report: 20%, Essay: 40%

Prescribed Reading:

FAO 2003. The ecosystem approach to fisheries. FAO Technical Guidelines for Responsible Fisheries, no. 4, suppl. 2. Rome: FAO. 112 p.

FAO 2008. Fisheries management. 2. The ecosystem approach to fisheries. 2.1. Best practices in ecosystem modelling for informing an ecosystem approach to fisheries. FAO Fisheries Technical Guidelines for Responsible Fisheries, no. 4, suppl. 2, add. 1. Rome: FAO. 78 p.

Preston G. 2009a. The ecosystem approach to coastal fisheries and aquaculture in Pacific Island countries and territories. Part 1: A review of current status. Part 2: Principles and approaches for strategic implementation. TNC Pacific Island Countries Report no. 1/08. Noumea, New Caledonia: Secretariat of the Pacific Community (SPC) and The Nature Conservancy (TNC). 123 p. http://www.spc.int/coastfish/Reports/EAFM_Workshop/Ecosystem_rpt1.pdf. Retrieved from the Internet 13 February 2010.

Preston G. 2009b. The ecosystem approach to coastal fisheries and aquaculture in Pacific Island countries and territories (booklet). Secretariat of the Pacific Community and The Nature Conservancy. Noumea, New Caledonia. 20 p. http://www.spc.int/coastfish/Reports/EAFM_Workshop/EAFM_Booklet.pdf. Retrieved from the Internet 13 February 2010. SPC, 2010. A community-based approach to fisheries management: guidelines for Pacific Island countries. Secretariat of the Pacific Community.

SPC, 2010. A community-based approach to fisheries management: guidelines for Pacific Island countries. Secretariat of the Pacific Community.



CORAL TRIANGLE INITIATIVE

ON CORAL REEFS, FISHERIES AND FOOD SECURITY

